Claims:

1. A process for the treatment of the circulating water in painting booths, wherein the paint particles are dispersed by addition of dispersants which are selected from:

(a) homo- and co-polymers based on maleic acid, acrylic acid and/or methacrylic acid having molecular weights in the range between 2,500 and 500,000;

(b) non-ionic surfactants;

(c) anionic surfactants, no polyaspartic acid being additionally added to the circulating water in this case;

(d) inorganic or non-polymeric organic complexing agents and mixtures thereof;

the total concentration thereof being between 0.01 and 2.0 wt.%, based on the circulating water.

2. A process as claimed in claim 1 wherein the dispersants are non-ionic surfactants, selected from alkoxylates of fatty acids, fatty alcohols or fatty amines having 7 to 36, preferably 10 to 22, carbon atoms in the fatty alkyl group and having 5 to 100, preferably 10 to 80, alkylene oxide units.

3. A process as claimed in claim 1 wherein the dispersants are inorganic or non-polymeric organic complexing agents, selected from:

(i) organic carboxylic acids having two to ten heteroatoms, which may coordinate on metal ions, particularly from citric acid, tartaric acid, malic acid, gluconic acid, nitrilotriacetic acid, ethylenediamine tetraacetic acid, methylglycine diacetic acid;

(ii) organic phosphonic acids, particularly from 1-hydroxyethane-1,1-diphosphonic acid, aminotrimethylene phosphonic acid and phosphonobutane tricarboxylic acid;

(iii) oligomeric or polymeric inorganic phosphates, particularly Na triphosphate, Na pyrophosphate and Na hexametaphosphate.

4. A process as claimed in one of claims 1 to 3 wherein dispersants selected from:

(a) homo- and co-polymers of acrylic acid and/or methacrylic acid having molecular weights of between 2,500 and 500,000, preferably from 15,000 to 250,000;

(b) non-ionic surfactants;

(d) inorganic or non-polymeric organic complexing agents; are used and 0.2 to 2 wt.%, based on the circulating water, of polyaspartic acid is additionally added to the circulating water.

5. A process as claimed in claim 1 wherein the dispersants are anionic surfactants which are selected from soaps, alkyl sulfates, alkyl sulfonates, alkylbenzene sulfonates, alkylether sulfates each having 7 to 44, preferably 8 to 22, carbon atoms in the alkyl group, and from sulfonated maleic acid esters.

6. A process as claimed in one of more of claims 1 to 5 wherein the paint particles are separated from the circulating water by means of a membrane filtration.

7. A process for the treatment of the circulating water in painting booths, wherein the circulating water has a hardness of at least 2° German hardness and wherein the paint particles are dispersed by addition of dispersants in a concentration between 0.01 and 2.0 wt.% based on the circulating water in such a way that they exhibit an average particle size, which may be determined by means of laser diffraction, of below 20 μm.

8. A process as claimed in claim 7 wherein the dispersants are selected from:

(a) homo- and co-polymers based on maleic acid, acrylic acid and/or methacrylic acid having molecular weights of between 2,500 and 500,000;

(b) non-ionic surfactants;

(d) inorganic or non-polymeric organic complexing agents and mixtures

thereof.

9. A process as claimed in claim 7 wherein the dispersants are non-ionic surfactants selected from alkoxylates of fatty acids, fatty alcohols or fatty amines having 7 to 36, preferably 10 to 22, carbon atoms in the fatty alkyl group and having 5 to 100, preferably 10 to 80, alkylene oxide units.

10. A process as claimed in claim 7 wherein the dispersants are inorganic or non-polymeric organic complexing agents selected from:

(i) organic carboxylic acids having two to ten heteroatoms, which may coordinate on metal ions, particularly from citric acid, tartaric acid, malic acid, gluconic acid, nitrilotriacetic acid, ethylenediamine tetraacetic acid, methylglycine diacetic acid;

(ii) organic phosphonic acids, particularly from 1-hydroxyethane-1,1-diphosphonic acid, aminotrimethylene phosphonic acid and phosphonobutane tricarboxylic acid;

(iii) oligomeric or polymeric inorganic phosphates, particularly Na triphosphate, Na pyrophosphate and Na hexametaphosphate.

11. A process as claimed in one or more of claims 7 to 10 wherein dispersants selected from:

(a) homo- and co-polymers of acrylic acid and/or methacrylic acid having molecular weights of between 2,500 and 500,000, preferably from 15,000 to 250,000;

(b) non-ionic surfactants;

(d) inorganic or non-polymeric organic complexing agents; are used and 0.2 to 2 wt.%, based on the circulating water, of polyaspartic acid is additionally added to the circulating water.

12. A process as claimed in claim 7 wherein the dispersants are selected from:

(c) anionic surfactants

and no polyaspartic acid is added to the circulating water.

13. A process as claimed in claim 12 wherein the anionic surfactants are selected from soaps, alkyl sulfates, alkyl sulfonates, alkylbenzene sulfonates, alkylether sulfates each having 7 to 44, preferably 8 to 22, carbon atoms in the alkyl group, and from sulfonated maleic acid esters.

14. A process as claimed in one or more of claims 7 to 13 wherein the paint particles are separated from the circulating water by means of a membrane filtration.

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